Pearson
BTEC

Mark Scheme (Results)

June 2022

Pearson BTEC Nationals
In Animal Management (31644H)
Unit 1: Animal Breeding and Genetics

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications website at http://qualifications.pearson.com/en/home.html for our BTEC qualifications.

Alternatively, you can get in touch with us using the details on our contact us page at http://qualifications.pearson.com/en/contact-us.html

If you have any subject specific questions about this specification that require the help of a subject specialist, you can speak directly to the subject team at Pearson. Their contact details can be found on this link:
http://qualifications.pearson.com/en/support/support-for-you/teachers.html

You can also use our online Ask the Expert service at https://www.edexcelonline.com
You will need an Edexcel Online username and password to access this service.

Pearson: helping people progress, everywhere

Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your learners at: www.pearson.com/uk.

June 2022
Publications Code 31644H_2206_MS
All the material in this publication is copyright
© Pearson Education Ltd 2022

General marking guidance

- All learners must receive the same treatment. Examiners must mark the first learner in exactly the same way as they mark the last.
- Marking grids should be applied positively. Learners must be rewarded for what they have shown they can do, rather than be penalised for omissions.
- Examiners should mark according to the marking grid, not according to their perception of where the grade boundaries may lie.
- All marks on the marking grid should be used appropriately.
- All the marks on the marking grid are designed to be awarded. Examiners should always award full marks if deserved. Examiners should also be prepared to award zero marks, if the learner's response is not rewardable according to the marking grid.
- Where judgement is required, a marking grid will provide the principles by which marks will be awarded.
- When examiners are in doubt regarding the application of the marking grid to a learner's response, a senior examiner should be consulted.

Specific marking guidance

The marking grids have been designed to assess learner work holistically. Rows in the grids identify the assessment focus/outcome being targeted. When using a marking grid, the 'best fit' approach should be used.

- Examiners should first make a holistic judgement on which band most closely matches the learner's response and place it within that band. Learners will be placed in the band that best describes their answer.
- The mark awarded within the band will be decided based on the quality of the answer, in response to the assessment focus/outcome and will be modified according to how securely all bullet points are displayed at that band.
- Marks will be awarded towards the top or bottom of that band, depending on how they have evidenced each of the descriptor bullet points.

Question Number	Answer	Mark
1 (a)	Award **one** mark for any of the following to a total of **two** marks. • Pets • Showing • Conservation Accept any other relevant phrasing/wording.	2

Question Number	Answer	Mark
1 (b)	Award **one** mark for identification and **one** additional mark for appropriate expansion. Males are too heavy (1) so they prevent crushing (1). Males claws/spurs are dangerous (1) so they protect the hen (1). Accept any other valid response.	2

Question Number	Answer	Mark
1 (c)	Award **one** mark for the identification and **one** additional mark for the linked descriptive comment to a maximum of **four** marks. Snood (1) hanging from the face/over the beak (1). Wattle (1) under the beak (1). Caruncles (1) that change colour (1). Spurs (1) for fighting other males (1). Breast beards (1) to attract females (1). Colourful feathers (1) for display (1). Accept any other valid response.	4

Question Number	Answer	Mark
2 (a)	Award **one** mark for any of the following to a total of **four** marks. • Beak • Conformation • Size • Feather colour • Limbs • Cloaca Accept any other valid response.	4

Question number	Indicative content
2 (b)	Answers will be credited according to the learner's demonstration of knowledge and understanding of the material using the indicative content and levels descriptors below. The indicative content that follows is not prescriptive. Answers may cover some/all of the indicative content but should be rewarded for other relevant answers. Answers will consider all the factors that need to be covered when assessing livestock for their suitability including; animal's purpose, effectiveness in breeding, breed standards and meeting the aim of purchase. **There is a limited choice of turkey varieties:** • The white Holland is the most common meat production turkey. It often grows too large to mate naturally and AI has to be used to produce fertile eggs. It is not very impressive to look at. Tends to have health issues because of the speed of growing. • American bronze turkeys and other heritage varieties can breed naturally, they produce tastier, healthier meat. • Heritage varieties are better suited for free-range conditions. • Size appropriate to the available housing/space. • Heritage varieties produce viable eggs without artificial insemination.

Mark scheme (award up to 12 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.

Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1–4	• Demonstrates isolated elements of knowledge and understanding presented in an unstructured format. • Limited reference to relevant evidence linked to the assessment. • A recommendation may be presented, but will lack focus and be superficial and underdeveloped.
Level 2	5–8	• Demonstrates mostly accurate knowledge and understanding. There is some structure to the response. • The answer is mostly supported through the application of relevant evidence drawn from the assessment and wider research. • Recommendation will be mostly focused and developed and show some linkages and lines of reasoning.
Level 3	9–12	• Demonstrates accurate and thorough knowledge and understanding presented in a clear and logical format. • Answer is fully supported throughout by sustained application of relevant evidence drawn directly from the assessment and wider independent research. • Recommendation will be clear, concise and well developed

Question Number	Answer	Mark
3 (a)	Award one mark for each of the following to a maximum of **eight** marks.	8

		Male Nnbb (1)			
		Nb	Nb	nb	nb (1)
Female nnBb (1)	nB	NnBb	NnBb	nnBb	nnBb
	nb	Nnbb	Nnbb	nnbb	nnbb
	nB	NnBb	NnBb	nnBb	nnBb
	Nb (1)	Nnbb	Nnbb	nnbb	Nnbb

Correct male genotype (1)
Correct female genotype (1)
Correct male gametes (1)
Correct female gametes (1)

Black 1 nucleus 4(1)
Bronze 1 nucleus 4 (1)
Black 2 nuclei 4 (1)
Bronze 2 nuclei 4 (1)

Probability is 1:1:1:1 or 25% each (1)

Question Number	Answer	Mark
3 (b)	Award **one** mark for each descriptive point to a maximum of **two** for each law. Law of dominance Some alleles are dominant (1) they mask recessive alleles (1). Law of independent assortment Alleles for one gene segregate independently (1) from the alleles of other genes (1). Accept any other relevant phrasing/wording.	4

Question Number	Answer	Mark
4 (a)	Award **one** mark for the identification and **one** additional mark for the appropriate expansion to a maximum of **six** marks. Correct humidity (1) to prevent drying out/control development of air pocket (1). Correct temperature (1) to prevent embryo death/deformities (1). Regular turning (1) to prevent adhesion (1). Allow ventilation (1) to control gas exchange (1). Accept any other valid response.	6

Question Number	Answer	Mark
4 (b)	Award **one** mark for the identification and **one** additional mark for the appropriate expansion to a maximum of **four** marks. Diarrhoea (1) caused by internal parasites/ viral/adenovirus (1). Feather pecking (1) due to dietary deficiency (1). Disfigured bones/joints (1) caused by lack of sunshine (1). Dark head (1) due to protozoan infection (1). Accept any other valid response/wording.	4

Question Number	Answer	Mark
4 (c)	Award **one** mark for identification and **one** additional mark for appropriate expansion. Recessive allele (1) when homozygous causes death (1). Accept any other relevant phrasing/wording.	2

Question Number	Answer	Mark
4 (d)	Award **one** mark for the identification and **one** additional mark for the appropriate expansion to a maximum of **four** marks. Commercial breed males have a huge chest (1) so they cannot mount the female (1). The males grow very large (1) so can injure the females (1). One male can inseminate many females (1) increasing desirable characteristics (1). Overcomes fertility issues (1) due to excessive muscling (1). Breeders can choose the male (1) so controlling the genetics (1). Accept any other valid response.	4

Question Number	Answer	Mark
5 (a)	Award **one** mark for the identification and **one** additional mark for the appropriate expansion to a maximum of **six** marks. Transgenics Move genes from one species to another (1) to introduce desirable characteristics (1). Gene therapy Alter genes/DNA sequence (1) to prevent/cure genetic illnesses (1). DNA screening Identify DNA sequences (1) to find genetic faults/problems/disorders (1). Accept any other valid response.	6

Question Number	Answer	Mark
5 (b)	Award **one** mark for the identification and **one** additional mark for the appropriate expansion to a maximum of **four** marks. Large breasts (1) to increase meat production (1). Quick maturing (1) to reduce production time (1). Efficient meat production (1) to reduce costs (1). White feathers (1) to reduce dark pin feathers/make carcass dressing easier (1). Increased disease resistance (1) for better quality meat (1). Accept any other valid response.	4

<table>
<tr><th>Question number</th><th colspan="2">Indicative content</th></tr>
<tr><td>6 (a)</td><td colspan="2">Answers could include:

• Gene hunting is the process of finding genes that contribute to individual differences in phenotypes.
• The phenotypes may be diseases and disorders or part of normal variation.
• Genes that improve production, e.g. meat quality/mass, can be identified and introduced into the population increasing yields.
• Genes that cause genetic disorders can be identified and removed/not selected for thus increasing health.
• Genes that contribute to genetic predisposition can be removed/not selected for thus making animals more robust.</td></tr>
<tr><td colspan="3">Mark scheme (award up to 6 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.</td></tr>
<tr><td>Level</td><td>Mark</td><td>Descriptor</td></tr>
<tr><td>Level 0</td><td>0</td><td>No rewardable material.</td></tr>
<tr><td>Level 1</td><td>1–2</td><td>• Demonstrates isolated elements of knowledge and understanding, there will be major gaps or omissions.
• Few of the points made will be relevant to the context in the question.
• Limited discussion which contains generic assertions rather than considering different aspects and the relationship between them.</td></tr>
<tr><td>Level</td><td>Mark</td><td>Descriptor</td></tr>
<tr><td>Level 2</td><td>3–4</td><td>• Demonstrates some accurate knowledge and understanding, with only minor gaps or omissions.
• Some of the points made will be relevant to the context in the question, but the link will not always be clear.
• Displays a partially developed discussion which considers some different aspects and some consideration of how they interrelate, but not always in a sustained way.</td></tr>
<tr><td>Level 3</td><td>5–6</td><td>• Demonstrates mostly accurate and detailed knowledge and understanding.
• Most of the points made will be relevant to the context in the question, and there will be clear links.
• Displays a well-developed and logical discussion which clearly considers a range of different aspects and considers how they interrelate, in a sustained way.</td></tr>
</table>

Question number	Indicative content
6 (b)	Answers could include: • Selective breeding is only breeding animals with 'desirable characteristics'. • White Holland turkeys have been selected for breast muscle mass. • This is required to meet the demand for cheaper turkey meat. • So is a 'necessary evil' from a utilitarian point of view. • The increased muscle mass means that the turkeys cannot mate naturally, their food requirements mean that they cannot be free range. For some people this is ethically unacceptable. • Responses may link this to the five needs, and the welfare act. In particular the need to exhibit normal behaviour patterns and the need to be protected from pain and suffering. The increased weight and increased speed of growth leads to joint and skeletal problems. • European Food Safety Authority controls and oversees the running of genetic modification. Assesses and communicates the dangers of genetic modification. • Responses may discuss the effect on human health and the environment. • Links may be made to other species, e.g. beef bulls, etc.

Mark scheme (award up to 12 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.

Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1–4	• Demonstrates isolated elements of knowledge and understanding, there will be major gaps or omissions. • Few of the points made will be relevant to the context in the question. • Limited discussion which contains generic assertions rather than considering different aspects and the relationship between them.
Level	**Mark**	**Descriptor**
Level 2	5–8	• Demonstrates some accurate knowledge and understanding, with only minor gaps or omissions. • Some of the points made will be relevant to the context in the question, but the link will not always be clear. • Displays a partially developed discussion which considers some different aspects and some consideration of how they interrelate, but not always in a sustained way.
Level 3	9–12	• Demonstrates mostly accurate and detailed knowledge and understanding. • Most of the points made will be relevant to the context in the question, and there will be clear links. • Displays a well-developed and logical discussion which clearly considers a range of different aspects and considers how they interrelate, in a sustained way.

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom